

### **REMARKS**

This responds to the Office Action mailed on December 11, 2006, and the references cited therewith.

Claims 1-23 are pending in this application. However, the Examiner has withdrawn claims 1, 11 and 21-23 from consideration as a result of the restriction requirement. Accordingly, claims 2-10 and 12-20 are now under examination.

Claims 2, 3, 4, 6, 8, 9, 10, 12, 13, 15, 18, 19 and 20 have been amended. The term "binary" is used prior to "digital data" in claims 2, 3 and 12. Support for subject matter relating to streams of binary digital data is present throughout the specification as originally filed, for example, in paragraphs 49, 56-64 and in FIGs. 7 and 8.

The phrase "digitally encoded molecular current" in claims 6 and 15 (which was a poor translation of the original German phrase) has been clarified to recite "current of molecules that can operate in a digital manner."

The phrase "by means of a laser beam or other photon source" has been deleted from claims 4 and 13; and the phrase "either by means of an expression defined in force, time or space" has been deleted from claims 8 and 18. In addition, an inadvertent typographical error in claim 8 ("subtracting") has been corrected. Due to the deletion of text from claims 8 and 18, the language and dependencies of claims 9, 10, 19 and 20 have been modified to provide proper antecedent basis for the terms therein.

Applicants submit that no new matter has been added to the application and that these amendments do not narrow the scope of the claims.

### ***Interview Summary***

Applicants wish to thank Examiner Lin for extending the courtesy of a telephone interview to Inventor James La Clair and Applicants' representative, Robin A. Chadwick, on March 9, 2007.

Examiner provided an explanation of the rejection of the claims over O'Keefe (US 2002/0004204 A1). Inventor La Clair described his invention and explained how his invention was distinct from the O'Keefe reference. In particular, Inventor La Clair stated that the O'Keefe reference discloses detection of molecules using an analog device that utilizes analog signals

(e.g. light) whereas La Clair's invention passes a digital stream of binary information through a substrate and detecting molecular changes/interactions by observing changes in the stream of digital data. La Clair provided examples of a stream of digital data, including light (e.g. pulses of light), gated electron flow, and molecules that can exist in two states.

The Examiner suggested that the language of Applicant's claims might be clarified. Applicant's representative and Inventor La Clair acknowledged this suggestion and stated they would consider it.

This account is believed to be a complete and accurate summary of the interview as required by 37 C.F.R. § 1.133. If the Examiner believes that this summary is inaccurate or incomplete, Applicants respectfully request that the Examiner point out any deficiencies in his next communication so that Applicants can amend or supplement the interview summary.

#### ***Restriction Requirement***

Applicant appreciates the Examiner clarification of which claims are under examination (claims 2-10 and 12-20).

#### ***§112 Rejection of the Claims***

Claims 2-10 and 12-20 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly indefinite.

Applicant submits that indefiniteness depends on whether one of skill in the art would understand the scope of the claim when the claim is read in light of the specification. *North American Vaccine Inc. v. American Cyanamid Co.*, 7 F.3d 1571, 28 USPQ2d 1333 (Fed. Cir. 1993). If the claims read in light of the specification reasonably apprise those skilled in the art of the scope of the invention, § 112 demands no more. *Miles Laboratories Inc. v. Shandon, Inc.*, 997 F.2d 870, 27 USPQ2d 1123 (Fed. Cir. 1993).

#### **Stream of digital data**

The Examiner has stated that the phrase "stream of digital data" in claims 2 and 12 is unclear, asserting that a stream of digital data is a series of numerical information and it is unclear as to how such a series of numerical information passes through a physical object.

However, digital information is routinely passed through fibers, wires and circuits when optical and electronic signals are transmitted. Moreover, digital streams are well defined in the art, for example, in art relating to digital music, digital telephones, and digital electronic devices.

Applicant also submits that the specification apprises the skilled artisan of meaning of the phrase “stream of digital data,” for example, the specification clearly describes a method for examining the modulation of digital streams (strings of 0101010) as given by electronic or optical patterns of 0s and 1s (on vs off) states by molecular interactions (see, e.g., FIG. 7). In such a system a molecular interaction would serve to change a stream 000000 to 000100 (see, e.g., FIGs. 7-9). The “stream” of digital data permits continuous monitoring of molecular interactions and molecular changes over time. Thus, the kinetics of molecular interactions/changes can be monitored (see, e.g., FIG. 9).

Applicant submits that the meaning of “stream of digital data” is clear and requests withdrawal of this rejection under 35 U.S.C. § 112, second paragraph, with respect to claims 2 and 12.

#### **Photon flux by means of a laser beam or other photon source**

The Examiner has indicated recitation of a broader term (photon flux) and a narrower term (laser beam) in claims 4 and 13 is indefinite. Claims 4 and 13 currently do not recite “by means of a laser beam or other photon source.”

Applicant submits that the language of claims 4 and 13 is clear and requests withdrawal of this rejection under 35 U.S.C. § 112, second paragraph, with respect to these claims.

#### **Digitally encoded molecular current**

The Examiner has stated that the phrase “digitally-encoded molecular current” in claims 6 and 15 is unclear. Claims 6 and 15 now recite “a current of molecules that can operate in a digital manner.” Applicant submits that the examiner’s interpretation that the phrase implies that a fluorescence signal is generated by the molecules is not correct. More accurately, the interpretation is that the molecules that exist in two states a 0 state that is inactive or 1 state that is active.

Applicant submits that the language of claims 6 and 15 is clear and requests withdrawal of this rejection under 35 U.S.C. § 112, second paragraph, with respect to these claims.

**By means of an expression defined in force, time or space**

The Examiner has stated that the phrase “by means of an expression defined in force, time or space” in claims 8 and 18 is unclear. This phrase is no longer part of claims 8 and 18, and Applicant requests withdrawal of this rejection of claims 8 and 18.

Applicant submits that the language of claims 2-10 and 12-20 is clear and definite and respectfully requests withdrawal of this rejection under 35 U.S.C. § 112, second paragraph.

***§102 Rejection of the Claims***

Claims 2-10 and 12-20 were rejected under 35 U.S.C. § 102(e) as allegedly anticipated by O’Keefe (US 2002/0004204 A1) in light of Berlien et al (US 5850195). The Examiner alleges that O’Keefe teaches every element of claims 2-6, 8-10, 12-15 and 18-20, and that O’Keefe teaches the subject matter of claims 7, 16 and 17 as taught by Berlien.

Applicant reminds the Examiner that anticipation must be found in a single reference. A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Accordingly, Applicant will treat the rejection as a rejection over O’Keefe, where the Berlien reference is used to clarify the subject matter of the O’Keefe reference.

In addition to a requirement that references cannot be combined to show anticipation, Applicant notes that the reference must show the identical invention in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ 2d 1913, 1920 (Fed. Cir. 1989). To constitute anticipation, the claimed subject matter must be identically disclosed in the prior art. *In re Arkley*, 172 U.S.P.Q. 524 at 526 (C.C.P.A. 1972). For anticipation, there must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the art. *Scripps Clinic & Res. Found. v. Genentech, Inc.*, 927 F.2d 1565, 18 USPQ2d 101 (Fed. Cir. 1991). To overcome the defense of anticipation, “it is only necessary for the patentee to show some tangible difference between the

invention and the prior art.” *Del Mar Engineering Lab v. Physio-Tronics, Inc.*, 642 F.2d 1167, 1172, (9<sup>th</sup> Cir. 1981).

Moreover, an anticipation rejection that is based on inherency must be supported by factual and technical grounds establishing that the inherent feature must flow as a necessary conclusion, not simply a possible conclusion, from the teaching of the cited art. *Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Int. 1990); *In re Oelrich*, 666 F.2d 578, 212 U.S.P.Q. 323, 326 (C.C.P.A. 1981).

Applicant submits that the present claims are not anticipated because O’Keefe fails to provide any disclosure or suggestion of a method or device where a stream of binary digital data is manipulated by molecular interaction. O’Keefe discloses a system that monitors signal modulation, however this modulation is conducted in an analog manner. While the Examiner cites to O’Keefe at page 6, paragraph 0065 as allegedly describing a method and device that includes creating at least one stream of digital data and transferring it through a substrate, the construct described by O’Keefe in paragraph 0065 is still an analog device that examines the transmission of an electronically conductive signal. It is not a digital signal. As proof that O’Keefe is limited to analog processes, the words “digit” and “data” do not appear in paragraphs 0065, 0082, 0083, 0012, or 0106. Thus, there is no basis for identifying the O’Keefe system as a digital device.

Instead of describing a digital process, the O’keefe reference describes a system that uses a device to convert light, electrical or other signals into a digital signal. In contrast, the present invention is directed to methods and system wherein digits encoded within a light, electrical or other signals are manipulated during a molecular assay. Detection of molecular changes and interactions is directly digital marked by the change in digital stream, for example, as given by an input of 0000 and its conversion to 0001. Thus, according to the present invention, molecular changes/associations directly cause a change in a digital signal. No such digital input and output is disclosed by O’Keefe.

Moreover, the Berlien disclosure does not satisfy any deficiency of the O’Keefe reference or teach any element relevant to the present invention. Instead Berlien is limited to disclosure of a monolithic light-to-digital signal converter. While such a converter may be used by O’Keefe to detect a molecular event through conversion of an analog signal into a digital signal, no such

analog-to-digital conversion is part of the present invention. Instead, the present invention uses a stream of digital data throughout the input and output steps of the present invention. Hence, the Berlien reference is irrelevant.

Applicant submits that claims 2-10 and 12-20 are novel and distinct over O'Keefe (US 2002/0004204 A1) in light of Berlien et al (US 5850195) and respectfully requests withdrawal of this rejection under 35 U.S.C. § 102(e).

**CONCLUSION**

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (516) 795-6820 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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Date March 12, 2007

By



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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 12th day of March, 2007 (Monday).

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